REMARKS

I. Interview Summary – Finality of Office Action

Applicants thank Examiner Cox for conducting a telephone interview with applicants' counsel on January 28, 2010. As applicants' counsel observed in the interview, the Office Action of December 31, 2009 should not have been a final rejection because that Office Action stated that applicants' arguments over the previous rejection of claim 11 were persuasive, but the Office Action nonetheless included a new rejection that was not necessitated by any amendments to claim 11. Therefore, the finality of the Office Action was improper under the Manual of Patent Examining Procedure Section 706.07(a). Examiner Cox agreed with this point, and withdrew the finality of the Office Action, as reflected in the Interview Summary dated February 5, 2010.

During the interview, applicants proposed obtaining an English-language translation of Seiji Japan Patent No. 09123731 ("Seiji"), which was newly cited in the Office Action, so that the issues raised in the rejection could be clarified. Applicants have received and attached this English-language translation.

II. Status of the Claims and the Rejections

Claims 1 and 11 were objected to for alleged indefiniteness. More specifically, claims 1 and 11 recited "a sensor" multiple times to refer to separate temperature sensors. Applicants have amended claims 1 and 11 to differentiate between these elements by reciting them as "an injection temperature sensor" and "an ambient temperature sensor." Applicants respectfully request that the objection to claims 1 and 11 be withdrawn.

Substantively, claims 1-2, 4-6, 11, 13 and 14 were rejected for alleged obviousness under 35 U.S.C. § 103 based on Fischer U.S. Patent No. 5,479,983 ("Fischer") in

view of Seiji. Claim 3 was rejected for alleged obviousness under 35 U.S.C. § 103 based on Fischer in view of Seiji and Taylor U.S. Patent No. 1,921,172 ("Taylor"). Applicants respectfully traverse these rejections.

However, applicants have amended independent claims 1 and 11 to further clarify the subject matter regarded as patentable. Applicants have also amended claim 4 and canceled claims 5, 13 and 14 in this response. These amendments are fully supported in the original specification at paragraphs [0015] and [0032]. In view of these amendments and the following remarks, applicants respectfully request reconsideration and allowance.

III. Claims 1-4, 6 and 11 are Not Obvious

A. The Claims

Independent claim 1 recites a method for the control of the temperature of feed air which is injected into a plurality of cabin zones of an aircraft. The method includes "independently controlling the temperature of feed air injected into each cabin zone dependent upon a deviation of an injection temperature actual value, measured by an injection temperature sensor, of the feed air injected into the respective cabin zone from an injection temperature target value." For a selected number of the cabin zones, the injection temperature target value is established by "comparing an ambient temperature actual value, measured by an ambient temperature sensor, for the respective cabin zone with an ambient temperature target value." For a first cabin zone that does not have an ambient temperature sensor and is not within the selected number of cabin zones, the injection temperature target value is based on "an injection temperature target value of at least one second cabin zone different from the first cabin zone and an injection air actual temperature of the at least one second cabin zone." Claims 2-4 and 6 depend from independent claim 1 and recite additional features, such as the injection temperature

target value for the first cabin zone being established also on the basis of "a first correction value which is constant and based on the physical zone-specific factors of the first cabin zone affecting heat transfer," as recited in claim 4.

Independent claim 11 recites a passenger aircraft having a plurality of cabin zones and an electronic control unit arranged to independently control the temperature of injected feed air. The electronic control unit operates in a similar manner as the method recited in claim 1, by establishing an injection temperature target value for each cabin zone and independently controlling the injection temperature for each cabin zone based on a deviation between the injection temperature target value and a measured injection temperature actual value. Again, for a selected number of the cabin zones, the injection temperature target value is established using ambient temperature measurements, while for a first cabin zone without an ambient temperature sensor, the injection temperature target value is established using the injection temperature actual and target values for another zone.

B. The Deficiencies of the Cited Prior Art

Fischer is directed to an air conditioning system for the passenger compartment of an aircraft. As shown in Fig. 1, Fischer teaches a passenger aircraft (1) with a passenger cabin (1B) divided into three air conditioning zones (2, 3, 4), each having a zone sensor (18-20) for sensing the ambient temperature within the zones (2-4). A controller (41) receives an input desired ambient temperature from temperature selectors (45-47) in the respective air conditioning zones (2-4). The controller (41) compares these values to the actual measured ambient temperatures in the zones (2-4) as measured by the zone sensors (18-20). The controller (41) then modifies the temperature of injected air delivered to a particular conditioning zone (2, for example) by comparing the desired temperature at the zone selector (45) with the actual measured ambient temperature from the zone sensor (18). Fischer does not disclose any control

unit that can control the temperature of air injected into a cabin zone without an ambient temperature measurement in the respective cabin zone.

The present assignee owns Fischer. If Fischer had solved the problems that are solved by the present invention, then there would have been no need for the present invention.

The Office Action turns to Seiji for the teaching of a temperature control system. Seiji is directed to a control system for the air-conditioning of a car. Seiji teaches that in order to overcome localized temperature differences caused by sunlight irradiation on one side of the car, a control system creates a dynamic model for estimating the ambient temperature for different regions in the car (para. [0021]). The dynamic model includes a plurality of heat related physical quantities including the vehicle interior desired temperature set by a passenger, the ambient external air temperature, sunlight irradiation, and heat capacity of the vehicle interior, among other quantities (para. [0031]).

For a first region having an ambient temperature sensor, the dynamic model is applied to estimate the ambient temperature, and the dynamic model is corrected by any difference detected between the model's estimated ambient temperature and the actual measured ambient temperature. Then the same corrected dynamic model is applied to all regions of the car, including those without ambient temperature sensors. For a second region of the car beyond the first region, a correction factor called K2 is applied to the model to correct for the variable rates of heat transfer between the first region and the second region. As shown in para. [0040], this K2 value is directly based on β values for each cabin zone, the β representing a rate of heat transfer which changes over time.

However, the combination of Fischer and Seiji is deficient. Seiji is specifically directed to controlling the air-conditioning of a car to overcome localized temperature differences caused by differing amounts of sunlight radiation on different sides of the car. In an

aircraft, the influence of sunlight irradiation on various cabin zones is insignificant and does not noticeably affect the air-conditioning of different cabin zones. Consequently, a person of ordinary skill in the aircraft art would not have considered Seiji to be combinable with aircraft air-conditioning control systems like the one disclosed in Fischer because Seiji overcomes a problem that does not exist in the aircraft art. The Office Action fails to identify an objective reason for making this combination. For at least this reason, the combination of Fischer and Seiji is improper.

In any event, even if Fischer and Seiji were combined in the manner suggested in the Office Action, the resulting control system would not meet the requirements of independent claims 1 and 11. Independent claims 1 and 11 require that the injection temperature of feed air delivered to each cabin zone be independently controlled. Furthermore, the electronic control unit controls this injection temperature by establishing an injection temperature target value for each zone. The electronic control unit establishes this injection temperature target value in a completely different manner depending on whether the selected cabin zone has an ambient temperature sensor. Thus, the currently claimed system provides genuinely independent control of the temperature in each cabin zone despite a lack of ambient temperature sensors in some of the cabin zones.

As explained in the current application, the different cabin zones need independent temperature control because the density of passengers in each zone could be different. Thus, relying on the ambient temperature sensors in other zones with higher passenger density (and thus requiring more cooling) would lead to the undesirable result of providing too much cooling for the cabin zones with a lower passenger density and no ambient temperature sensor. The control unit of the present invention overcomes this problem.

As discussed previously, the control system of Fischer necessarily relies on ambient temperature sensors to control the temperature in each cabin zone. Seiji provides a sophisticated dynamic model for estimating an ambient temperature in a zone without a temperature sensor, but this dynamic model only accounts for external irradiation and heat transfer qualities, not passenger density. Furthermore, the dynamic model is corrected for all zones equally using the temperature readings from an ambient temperature sensor (K1, as described in para. [0039] of Seiji). Thus, Seiji fails to provide truly independent temperature control of various regions without ambient temperature sensors.

Additionally, this difference is further clarified by the expressly-recited operation of the control unit in independent claims 1 and 11. The control unit establishes an injection temperature target value for each cabin zone. Fischer and Seiji fail to establish such an injection temperature target value for any zone. Even if one or both of the references could be considered to establish an injection temperature target value, it is certainly clear that neither reference teaches establishing this injection temperature target value based solely on the injection temperature target values of other cabin zones.

For at least these reasons, even the purported hypothetical combination of Fischer and Seiji fails to disclose each feature of independent claims 1 and 11. Thus, applicants respectfully request that the rejection of claims 1 and 11 be withdrawn.

Each of claims 2-4 and 6 depends from independent claim 1, and recites one or more additional features in combination with the features of claim 1. For substantially the same reasons set forth with respect to claim 1, and further because Fischer and Seiji do not teach the combination of elements recited in any of these claims, applicants respectfully request that the rejection of claims 2-4 and 6 be withdrawn.

With reference to dependent claim 4, the claim recites that the injection temperature target value for the first cabin zone is established on the basis of "a first correction value which is constant and based on the physical zone-specific factors of the first cabin zone affecting heat transfer." The Office Action states that the correction value for the different zones of Seiji is a predetermined constant value, but this is incorrect. As explained above, the correction value K2 in Seiji for applying the dynamic model in a second region directly depends upon β, which is a rate of heat transfer that continuously changes over time (para. [0031], [0040]). Thus, it is impossible for K2 to be "constant" as recited in claim 4. For at least this additional reason, applicants request that the rejection of claim 4 be withdrawn.

IV. Conclusion

Based on the amendments to the claims and these remarks, applicants respectfully assert that all present claims are in condition for allowance, and respectfully request an allowance without further delay.

It is believed that no fee is due for this filing. If any fee is deemed due, consider this as an authorization to charge Deposit Account 23-3000 therefore.

Respectfully submitted,

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Date

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